

PATENT ABSTRACTS OF JAPAN

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(54) ELECTROPHOTOGRAPHIC SENSITIVE BODY

(57)Abstract:

PURPOSE: To enhance photosensitive characteristics and strength against heat shock and mechanical impact and to reduce cost by forming a photosensitive layer containing a specified dipyrenylamine derivative as an effective component on a conductive substrate.



CONSTITUTION: The photosensitive layer 2 formed on the conductive substrate 1 contains as the effective component the dipyrenylamine derivative represented by formula I in which R is optionally substituted alkyl or such aryl. The photosensitive layer 2 comprising this derivative and a sensitizing dye and a binder resin is formed on the conductive substrate 1. The dipyrenylamine derivative acts as a photoconductive substance to generate and to transfer electric carriers necessary for photodecay, but since this derivative has almost no absorption in the visible light wavelength region, it is necessary to add a sensitizing dye having absorption in the visible wavelength region in the case of forming an image by the visible light.



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*** NOTICES ***

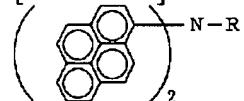
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CLAIMS

[Claim(s)]

[Claim 1] The photo conductor for electrophotography characterized by having the sensitization layer of the JIPIRE nil amine derivative expressed with the following general formula-ization 1 on a conductive base material which contains a kind as an active principle at least.

[Formula 1]

(R expresses among a formula the aryl group which is not permuted [the alkyl group which is not permuted / a permutation or /, a permutation, or].)

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the photo conductor for electrophotography which made the detailed compound of specification [the inside of a sensitization layer] contain about the photo conductor for electrophotography.

[0002]

[Description of the Prior Art] Conventionally, mineral matter, such as a selenium, a cadmium sulfide, and a zinc oxide, is one of those which are used as a photoconductivity material of the photo conductor used in an electrophotography method. It is one of the image-formation methods which the "electrophotography method" said here is a dark place first, for example, makes it the photo conductor of a photoconductivity charged by corona discharge, it subsequently carries out image exposure, it carries out the fly off of the charge of only the exposure section alternatively, acquires an electrostatic latent image, generally develops and visualizes this latent-image section by the electroscopic particle (toner) which consists of coloring matters, such as a color and a pigment, and binders, such as a high polymer, and formed the image.

[0003] As a fundamental property required of a photo conductor in such a xerography, that it can be charged in suitable potential in (1) dark place, that there is little fly off of a charge in (2) dark places, carrying out the fly off of the charge and dealing in it promptly, by (3) light exposure, etc. are raised.

[0004] By the way, the actual condition is that the aforementioned mineral matter also has various faults while each has many advantages. for example, current -- although the selenium used widely fully satisfies the conditions of aforementioned (1) - (3), the conditions to manufacture are difficult and it is difficult for a manufacturing cost to become high, and for there to be no flexibility, and to process it in the shape of a belt, and since it is sharp against the impact of heat or a machine target, there is also a fault, like handling takes cautions. Although the resin as a binder is distributed and it is used as a photo conductor, neither a cadmium sulfide nor a zinc oxide can be repeatedly used, if it remains as it is, since there are mechanical faults, such as smooth nature, a degree of hardness, tensile strength, and abrasion resistance.

[0005] In order to eliminate the fault of these mineral matter in recent years, the photo conductor for electrophotography using various organic substances is proposed, and there are some with which practical use is presented. For example, the photo conductor which consists of Polly N-vinylcarbazole and 2, 4, and 7-trinitro fluorene-9-ON (it indicates on U.S. Pat. No. 3484237 specifications), The photo conductor which comes to carry out sensitization of the Polly N-vinylcarbazole with pyrylium salt system coloring matter (it indicates to JP,48-25658,B), The photo conductor which uses an organic pigment as a principal component (it indicates to JP,47-37543,A), The photo conductor which uses as a principal component the eutectic complex which consists of a color and resin (it indicates to JP,47-10735,A), The photo conductor which comes to carry out coloring matter sensitization of the triphenylamine compound (U.S. Pat. No. 3,180,730), The photo conductor using an amine derivative as a charge transportation ingredient (JP,57-195254,A), The photo conductor using Polly N-vinylcarbazole and an amine derivative as a charge transportation ingredient (JP,58-1155,A), It is the photo conductor (U.S. Pat. No. 3,265,496, JP,39-11546,B, JP,53-27033,A) which uses a benzidine compound as a photoconduction ingredient also in the polyfunctional 3rd amine compound. Although these photo conductors have the outstanding property and it is thought also with it being practical that it is worthy, when various demands to a photo conductor are taken into consideration, in a xerography, the actual condition is that what fully satisfies these demands is not obtained yet.

[0006]

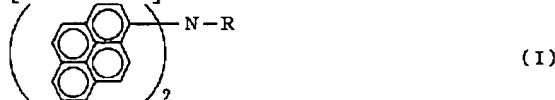
[Problem(s) to be Solved by the Invention] The purpose of this invention cancels the various faults which the

conventional photo conductor described previously has, and is to offer the photo conductor with which it may be satisfied of the conditions demanded in a xerography enough. Furthermore, manufacture can perform other purposes of this invention comparatively easily cheaply, and is to offer the photo conductor for electrophotography excellent also in endurance.

[0007]

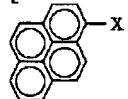
[Means for Solving the Problem] According to this invention, the photo conductor for electrophotography characterized by having the sensitization layer which contains at least one sort of a JIPIRE nil amine derivative expressed with the following general formula (I) and (**I) on a conductive base material as an active principle is offered.

[Formula 1]



[(R expresses among a formula the aryl group which is not permuted [the alkyl group which is not permuted / a permutation or /, a permutation, or].) 0008] The JIPIRE nil amine derivative expressed with said general formula (I) which a sensitization layer is made to contain in this invention, and (** 1) is for example, the following general formula (II) (** 2).

[Formula 2]



It is the halogeno pyrene and general formula (III) (** 3) which are expressed with (X expresses halogen atoms, such as a bromine or iodine, among a formula).

[Formula 3] or [making the amine derivative expressed with H2N-R (the inside of a formula and R are the same as the above) react] -- or a general formula (IV) (** 4)

[Formula 4]



The JI (1-pyrenyl) amine come out of and expressed, and a general formula (V) (** 5)

[Formula 5] It is manufactured by making the halogenide expressed with X-R (the inside of a formula, and X and R are the same as the above) react.

[0009] In said general formula (I), (II), and (V), R is an aryl group which is not permuted [the alkyl group which is not permuted / a permutation or /, a permutation, or], and when R is an aryl group, as this example, the aromatic series radical of non-condensation ring types, such as a phenyl group, a biphenyl radical, and a terphenyl radical, and a condensation polynuclear hydrocarbon radical, or a heterocycle type aromatic hydrocarbon radical is mentioned.

[0010] A 18-piece less or equal in this case, for example, [the carbon number which forms a ring preferably as a condensation polynuclear hydrocarbon radical] A pentalenyl radical, an indenyl group, a naphthyl group, an azulenyl radical, a hepta-RENIRU radical, A BIFE elm nil radical, as-in DASENIRU radical, a fluorenyl group, S-in DASENIRU radical, An ASENAFUCHIRENIRU radical, a play adenyl radical, an ASENAFU thenyl radical, a phenalenyl radical, A phenan tolyl group, an anthryl radical, a fluoran thenyl radical, an ASEFENANTORIRENIRU radical, the ASEAN TORIRENIRU radical, a TORIFE elm nil radical, a pyrenyl radical, a chestnut SENIRU radical, the North America Free Trade Agreement SENIRU radical, etc. are mentioned.

[0011] Moreover, the following radicals are mentioned as a heterocycle type aromatic hydrocarbon radical. [0012], such as a thienyl group, a furi radical, 2-pyridyl radical, 4-pyridyl radical, 3-indolyl radical, 2-quinolinyl group, 3, 4-bends pyranyl radical, an acridinyl radical, a thiazolyl radical, a benzo thia ZORONIRU radical, 9-methyl carbazolyl radical, 9-ethyl carbazolyl radical, 9-propyl carbazolyl radical, 9-phenyl carbazolyl radical, 9-tolyl carbazolyl radical, and 4-pyrazolyl radical Moreover, what has a substituent as shows an aryl group below is contained.

[0013] (1) a halogen atom, a cyano group, and a nitro group (2) alkyl group -- desirable -- C2-C12 -- it is the alkyl group of the straight chain of C1-C4, or branched chain still more preferably, and these alkyl groups are a hydroxyl group, a cyano group, the alkoxy group of C1-C4, a phenyl group or a halogen atom, the alkyl group of C1-C4, or an alkoxy group of C1-C4 further, and may especially contain C1-C8, and the permuted phenyl group. Specifically, a methyl group, an ethyl group, n-propyl group, i-propyl group, t-butyl, s-butyl, n-butyl, i-butyl, 2-hydroxyethyl radical, 2-cyano

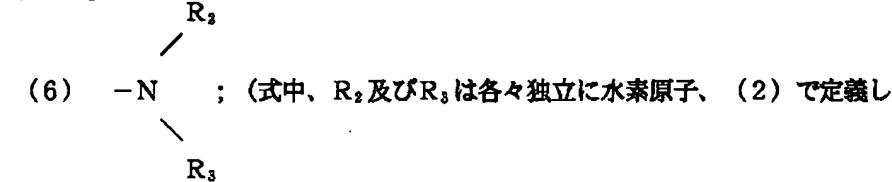
ethyl group, 2-ethoxyethyl radical, 2-methoxy ethyl group, benzyl, 4-chloro benzyl, 4-methylbenzyl radical, 4-methoxybenzyl radical, 4-phenyl benzyl, etc. are mentioned.

[0014] (3) Alkoxy group (-OR1); R1 expresses the alkyl group which (2) defined. Specifically, a methoxy group, an ethoxy radical, n-propoxy group, i-propoxy group, a t-butoxy radical, an n-butoxy radical, an s-butoxy radical, an i-butoxy radical, a 2-hydroxy ethoxy radical, 2-cyanoethoxy radical, a benzyloxy radical, 4-methylbenzyl oxy-radical, etc. are mentioned.

[0015] (4) Aryloxy group : a phenyl group and a naphthyl group are raised as an aryl group. This may contain the alkoxy group of C1-C4, the alkyl group of C1-C4, or a halogen atom as a substituent. Specifically, a phenoxy group, a 1-naphthyoxy radical, a 2-naphthyoxy radical, 4-methylphenoxy radical, 4-methoxy FENOKINO radical, 4-chloro phenoxy group, a 6-methyl-2-naphthyoxy radical, etc. are mentioned.

[0016] (5) Alkyl sulfhydryl group (-SR1); R1 expresses the alkyl group which (2) defined. Specifically, a methylthio radical, an ethyl thio radical, a phenylthio radical, p-methyl phenylthio radical, etc. are mentioned.

[0017]



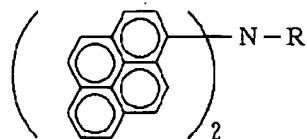
A ** alkyl group or an aryl group is expressed, a phenyl group, a biphenylyl radical, or a naphthyl group is mentioned as an aryl group, for example, and these may contain the alkoxy group of C1** - C4, the alkyl group of C1-C4, or a halogen atom as a substituent. R2 and R3 may form a ring together. Moreover, a ring may be formed in collaboration with the carbon atom on an aryl group. Specifically, amino-group, diethylamino radical, N-methyl-N-phenylamino radical, N, and N-diphenylamino radical, N, and N-JI (p-Trier) amino group, a dibenzylamino radical, a piperidino radical, a morpholino radical, a YURORIJIRU radical, etc. are mentioned.

[0018] (7) Alkylene dioxy radicals, such as a methylene dioxy radical or methylene dithio, or the alkylene dithio is mentioned.

[0019] In a general formula (I), (III), and (V), when R is an alkyl group, the thing same as this example as the example of (2) alkyl groups explained by the aryl group is mentioned. Moreover, the same thing as the example of the substituent similarly explained by the A **-RU radical as an example of R is mentioned.

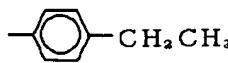
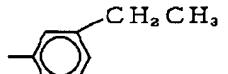
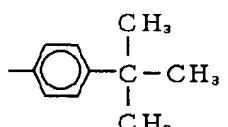
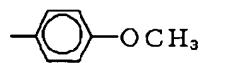
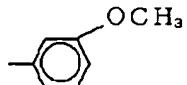
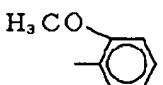
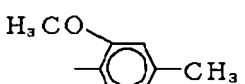
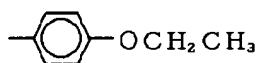
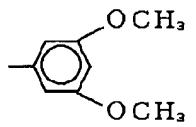
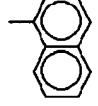
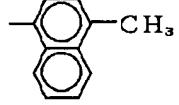
[0020] Hereafter, the example of representation of a JIPIRE nil amine derivative expressed with a general formula (I) is shown.

[Table 1-(1)]



化合物N o.	R
1	-CH ₃
2	-CH ₂ CH ₃
3	-CH ₂ -
4	-CH ₂ --CH ₃
5	
6	
7	
8	
9	
10	
11	

[Table 1-(2)]

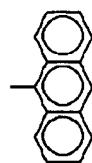
化合物 N o .	R
1 2	
1 3	
1 4	
1 5	
1 6	
1 7	
1 8	
1 9	
2 0	
2 1	
2 2	

[Table 1-(3)]

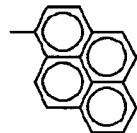
化合物 N o .

R

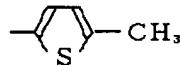
2 3



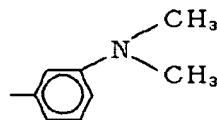
2 4



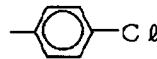
2 5



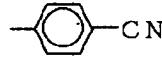
2 6



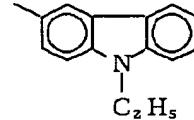
2 7



2 8



2 9



[0021] Although the sensitization layer 2 (2', 2", 2'', or 2''') is made to contain one sort of the above JIPIRE nil amine derivatives, or two sorts or more, the photo conductor of this invention can be used as the method of application of these JIPIRE nil amine derivative showed to drawing 1 , drawing 2 , drawing 3 , drawing 4 , or drawing 5 .

[0022] The sensitization layer 2 to which the photo conductor in drawing 1 consists of a JIPIRE nil amine derivative, a sensitization color, and a binder (binding resin) on the conductive base material 1 is formed. A JIPIRE nil amine derivative here acts as photoconductivity matter, and generation and migration of a charge carrier required for optical attenuation are performed through a JIPIRE nil amine derivative. However, since a JIPIRE nil amine derivative hardly has absorption in the visible region of light, it needs to add and carry out sensitization of the sensitization color which has absorption to a visible region by the light for the purpose which forms an image.

[0023] Sensitization layer 2' which the photo conductor in drawing 2 made distribute the charge generating matter 3 on the conductive base material 1 in the charge conveyance medium 4 which consists of a JIPIRE nil amine derivative and a binder is prepared. A JIPIRE nil amine derivative here forms a charge conveyance medium with a binder (or a binder and a plasticizer), and, on the other hand, the charge generating matter 3 (inorganic or charge generating matter like an organic pigment) generates a charge carrier. In this case, the charge conveyance medium 4 accepts the charge carrier which the charge generating matter 3 mainly generates, and is taking charge of the operation which conveys this. And if it is in this photo conductor, it is fundamental conditions that an absorption wavelength field does not lap [the charge generating matter and a JIPIRE nil amine derivative] mainly in a visible region mutually. This is because it is necessary to make light penetrate to a charge generating matter front face in order to make the charge generating matter 3 generate a charge carrier efficiently. When it combines with the charge generating matter 3 which the JIPIRE nil amine derivative expressed with a general formula (I) does not almost have absorption in a visible region, generally absorbs the beam of light of a visible region, and generates a charge carrier, it is the features to work as charge conveyance

matter effectively especially.

[0024] As for the photo conductor in drawing 3, sensitization layer 2" which consists of a laminating of the charge generating layer 5 which makes the charge generating matter 3 a subject, and the charge conveyance layer 4 containing a JIPIRE nil amine derivative is prepared on the conductive base material 1. In this photo conductor, by the light which penetrated the charge conveyance layer 4 reaching the charge generating layer 5, and generating of a charge carrier taking place in that field, the charge conveyance layer 4 receives impregnation of a charge carrier, that conveyance is carried out, and, on the other hand, generating of a charge carrier required for optical attenuation is performed by the charge generating matter 3, and conveyance of a charge carrier is performed by the charge conveyance layer 4 (a JIPIRE nil amine derivative mainly works). Such a device is the same as that of the explanation given in the photo conductor shown in drawing 2.

[0025] The photo conductor in drawing 4 makes reverse the order of a laminating of the 3rd charge generating layer 5 and the charge conveyance layer 4 containing a JIPIRE nil amine derivative, and generating of the charge carrier and the device of conveyance are made like the above-mentioned explanation. In this case, in consideration of a mechanical strength, a protective layer 6 can also be formed on the charge generating layer 5 like the 5th.

[0026] What is necessary is to dissolve one sort of a JIPIRE nil amine derivative, or two sorts or more in the solution which melted the binder, to build the liquid which added the sensitization color to this further, to apply this on the conductive base material 1, to dry, and just to form the sensitization layer 2, if it is the photo conductor shown in drawing 1 in order to actually produce this invention photo conductor.

[0027] 3-50-micrometer 5-20 micrometers are preferably suitable for the thickness of a sensitization layer. The amount of the JIPIRE nil amine derivative occupied in the sensitization layer 2 is about 50 % of the weight preferably 30 to 70% of the weight, and the amount of the sensitization color occupied in the sensitization layer 2 is 0.5 - 3 % of the weight preferably 0.1 to 5% of the weight. As a sensitization color, the brilliant green, Victoria blue B, Methyl Violet, A crystal violet, a thoria reel methane color like acid violet 6B, Rhodamine B, rhodamine 6G, rhodamine G extra, Eosine S Erythrosine, a rose bengal, xanthene dye like a fluorescein, Thiazine dye like a methylene blue, cyanine dye like cyanine, Pyrylium colors, such as 2, 6-diphenyl-4-(N and N-dimethylamino phenyl) thia pyrylium perchlorate, and benzo pyrylium salt (it indicates to JP,48-25658,B), etc. are mentioned. In addition, even if these sensitization colors are used independently, two or more sorts may be used together.

[0028] Moreover, what is necessary is to make the solution which dissolved one sort or two sorts or more of JIPIRE nil amine derivatives and binders distribute the particle of the charge generating matter 3, to apply this on the conductive base material 1, to dry, and just to form sensitization layer 2', in order to produce the photo conductor shown in drawing 2.

[0029] 3-50-micrometer 5-20 micrometers are preferably suitable for the thickness of sensitization layer 2'. The amount of the JIPIRE nil amine derivative occupied to sensitization layer 2' is 30 - 90 % of the weight preferably ten to 95% of the weight, and the amount of the charge generating matter 3 occupied to sensitization layer 2' is 1 - 20 % of the weight preferably 0.1 to 50% of the weight. As charge generating matter 3, for example A selenium and selenium-tellurium, a cadmium sulfide, As inorganic pigments, such as a cadmium-sulfide-selenium and alpha-silicon, and an organic pigment, for example, C.I. pigment blue 25 (Color Index CI 21180), The C eye pigment red 41 (CI 21200), C.I. acid red 52 (CI 45100), The C eye BASIC red 3 (CI45210), the azo pigment which has a carbazole frame (it indicates to JP,53-95033,A), The azo pigment which has a JISUCHIRIRU benzene frame (JP,53-133445,A), The azo pigment which has a triphenylamine frame (it indicates to JP,53-132347,A), The azo pigment which has a dibenzo thiophene frame (it indicates to JP,54-21728,A), The azo pigment which has an OKISA diazole frame (it indicates to JP,54-12742,A), full -- me -- non -- the azo pigment (it indicates to JP,54-22834,A) which has a frame -- The azo pigment which has a bis-stilbene frame (it indicates to JP,54-17733,A), The azo pigment which has a JISUCHIRIRUOKISA diazole frame (it indicates to JP,54-2129,A), Azo pigments, such as an azo pigment (it indicates to JP,54-14967,A) which has a JISUCHIRIRU carbazole frame, For example, phthalocyanine system pigments, such as C.I. pigment blue 16 (CI74100), for example, indigo system pigments, such as C eye BATTOBURAUN 5 (CI 73410) and C.I. vat dye (CI 73030), and Argo -- a scaw -- perylene system pigments, such as Let B (Bayer make) and indanthrene Scarlett R (Bayer make), etc. are mentioned. In addition, even if these charge generating matter is used independently, two or more sorts may be used together.

[0030] or [furthermore, / that the photo conductor shown in drawing 3 carries out vacuum deposition of the charge generating matter to one or more conductive base materials in order to produce] -- or It carries out whether the dispersion liquid distributed in the suitable solvent which dissolved the binder for the particle 3 of the charge generating matter as occasion demands are applied, and it dries. Furthermore, what is necessary is to perform surface finish, thickness adjustment, etc., to form the charge generating layer 5, to apply the solution which dissolved one sort or two

sorts or more of JIPIRE nil amine derivatives and binders, to dry, and just to form the charge conveyance layer 4 on this, by approaches, such as buffing, if required. In addition, the charge generating matter used for formation of the charge generating layer 5 here is the same as having carried out in explanation of aforementioned sensitization layer 2'. [0031] 5 micrometers or less of thickness of the charge generating layer 5 are 2 micrometers or less preferably, and 3-50-micrometer 5-20 micrometers are preferably suitable for the thickness of the charge conveyance layer 4. If the charge generating layer 5 is one of those of a type which distributed the particle 3 of the charge generating layer matter in the binder, the rate of occupying in the charge generating layer 5 of the particle 3 of the charge generating matter is about 50 - 90 % of the weight preferably ten to 95% of the weight. Moreover, the amount of the compound occupied in the charge conveyance layer 4 is 30 - 90 % of the weight preferably ten to 95% of the weight. What is necessary is to carry out the spreading desiccation of the dispersion liquid distributed in the solvent which dissolved the binder for the particle of the charge generating layer matter as occasion demands by approaches, such as spray coating, and just to form a charge generating layer 5 on this charge conveyance layer, after applying the solution which dissolved the JIPIRE nil amine derivative and the binder, drying and forming the charge conveyance layer 4 on the conductive base material 1, in order to create the photo conductor shown in drawing 4 . The quantitative ratio of a charge generating layer or a charge conveyance layer is the same as that of the contents explained by drawing 3 . Thus, the photo conductor which shows the still more suitable resin solution on the charge generating layer 5 of the obtained photo conductor to drawing 5 by forming a protective layer 6 by approaches, such as spray coating, can be created. The binder which carries out a postscript can be used as resin used here.

[0032] In addition, the plastic film which vapor-deposited metals, such as metal plates, such as aluminum, or a metallic foil, and aluminum, to the conductive base material 1 in these photo conductor manufactures [which], or the paper which performed electric conduction processing is used. Moreover, although condensation resin, such as a polyamide, polyurethane, polyester, an epoxy resin, the poly ketone, and a polycarbonate, a polyvinyl ketone, polystyrene, Polly N-vinylcarbazole, a vinyl polymerization object like polyacrylamide, etc. are used as a binder, all the resin that is insulation and has an adhesive property can be used. Although the plasticizer is added to the binder as occasion demands, as such a plasticizer, halogenation paraffin, polychlorinated biphenyl, dimethyl naphthalene, dibutyl phthalate, etc. can be illustrated.

[0033] Furthermore, a glue line or a barrier layer can be prepared in the photo conductor obtained as mentioned above between a conductive base material and a sensitization layer if needed. As an ingredient used for these layers, it is a polyamide, a nitrocellulose, an aluminum oxide, etc., and 1 micrometer or less of thickness is desirable. In order to copy using the photo conductor of this invention, after giving electrification and exposure to a sensitization side, development is performed and it imprints to paper etc. as occasion demands. The photo conductor of this invention has the advantage which was [be / sensibility is high and / sensibility / rich in flexibility] excellent.

[0034]

[Example] Hereafter, an example explains this invention. In addition, in the following example, all the sections are the weight sections.

[0035] [Composition of the compound of a general formula (I)]

[Synthetic example of compound No.19] It agitated at 207 degrees C for 6.5 hours, carrying out azeotropy dehydration of the 1.07g [of para toluidine] (10.0mmol), and 1-iodine pyrene 6.56g (20.0mmol), 5.53g [of potassium carbonate], 0.64g [of copper powder], and nitrobenzene 50ml with ester tubing under a nitrogen air current. After cooling radiationally to a room temperature, it filtered using cerite, vacuum concentration of the filtrate was carried out, and the nitrobenzene was distilled off. Chloroform was added to the obtained residue, the chloroform layer was rinsed, subsequently it dried with magnesium sulfate, vacuum concentration was carried out further, and dark brown oily matter was obtained. this -- silica gel column processing [eluate; -- it n-hexane (1:2) mixed-solvent] [toluene /] carried out, it recrystallized [mixed solvent / ethanol / / DMF], and N [of xanthelasma-like **] and N-JI (1-pyrenyl)-P-toluidine (compound No.9) 1.33g (26.2% of yield) was obtained. The melting point was 272.5-273.5 degrees C. The elemental-analysis value was as follows as C39H25N.

C% H% N%

実測値 9.2. 1.0 4. 8.1 2. 9.9

計算値 9.2. 2.8 4. 9.6 2. 7.6

[0036] On the aluminum side of the conductive base material which consists of a polyester base which carried out grinding mixing of the DAIAN blue (C.I. pigment blue 25, CI21180) 76 section, the 2% tetrahydrofuran solution of polyester resin (Made in [Toyobo] Byron 200) 1260 section, and the tetrahydrofuran 3700 section in the ball mill as example 1 charge generating matter, and carried out the vacuum plating of aluminium of the obtained dispersion liquid,

the doctor blade was used and it applied, and it seasoned naturally and the charge generating layer with a thickness of about 1 micrometer was formed. On the other hand as charge conveyance matter, the JIPIRE nil amine derivative 2 section of compound example No.9, After carrying out the mixed dissolution of the polycarbonate resin (pan light K1300, Teijin Make) 2 section and the tetrahydrofuran 16 section and considering as a solution, On said charge generating layer, used the doctor blade and applied this, and subsequently dried for 5 minutes at 120 degrees C for 2 minutes by 80 degrees C, the charge conveyance layer with a thickness of about 20 micrometers was made to form, and photo conductor No.1 was created.

[0037] Photo conductor No.2-33 were created completely like the example 1 except having replaced an example 2 - 33 charge generating matter, and the charge conveyance matter (JIPIRE nil amine derivative) with what was shown in Table 2.

[Table 2-(1)]

感光体No.	電荷発生物質	電荷搬送物質 (ジピレニル アミン誘導体 No.)
1		9
2		9
3		9

[Table 2-(2)]

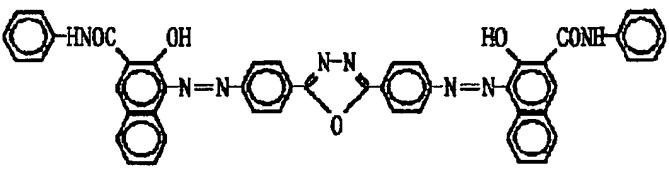
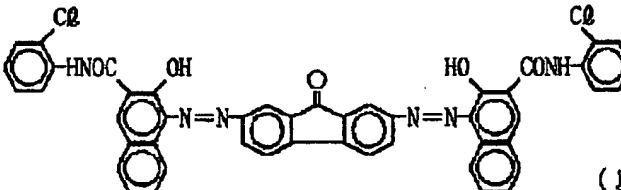
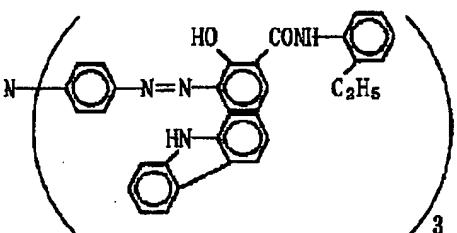
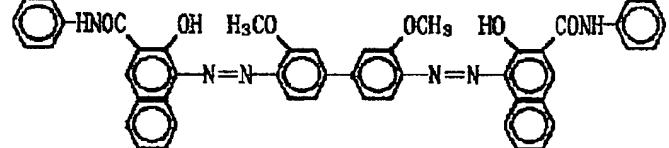
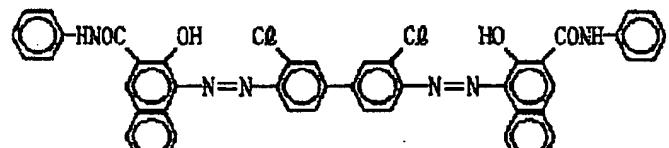
4		9
5		9 (以降P-2とする)
6		9 (以降P-3とする)
7	β 型銅フタロシアニン	9

Table 2-(3)]

8		15
9		15
10	P-1	15
11	P-2	15
12	P-3	15
13	P-1	3

[Table 2-(4)]

感光体No	電荷発生物質	電荷搬送物質 (ジビレニルアミン誘導体No.)
14	P-2	3
15	P-3	3
16	P-1	6
17	P-2	6
18	P-3	6
19	P-1	12
20	P-2	12
21	P-3	12
22	P-1	5
23	P-2	5
24	P-3	5

[Table 2-(5)]

感光体No	電荷発生物質	電荷搬送物質 (ジビレニルアミン誘導体No.)
25	P-1	20
26	P-2	20
27	P-3	20
28	P-1	21
29	P-2	21
30	P-3	21
31	P-1	27
32	P-2	27
33	P-3	27

[0038] Vacuum deposition of the selenium was carried out to about 1 micrometer in thickness, and the charge generating layer was made to form on an aluminum plate with an example 34 thickness of about 300 micrometers. Subsequently, the JIPIRE nil amine derivative 2 section of No.9, the polyester resin (Du Pont polyester ADOHISHIBU 49000) 3 section, and the tetrahydrofuran 45 section were mixed, it dissolved, and charge conveyance stratification liquid was built, after having used the doctor blade, applying this and seasoning naturally it on the above-mentioned charge generating layer (selenium vacuum evaporationo layer), dried under reduced pressure, the charge conveyance layer with a thickness of about 10 micrometers was made to form, and photo conductor No.34 of this invention were obtained.

[0039] It is a perylene system pigment [** 6] instead of example 35 selenium.

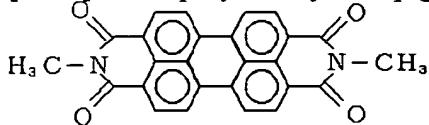


Photo conductor No.35 were created completely like the example 34 except having formed the ***** charge generating layer (however, thickness about 0.6 micrometers), and having used JIPIRE nil amine derivative No.9 as charge conveyance matter.

[0040] The mixture which added the tetrahydrofuran 158 section to the example 36 DAIAN blue (it is the same as what was used in example 1) 1 section is ground in a ball mill. After mixing, the JIPIRE nil amine derivative 12 section of No.9 and the polyester resin (Du Pont polyester ADOHISHIBU 49000) 18 section are added to this. Used and applied the doctor blade on vacuum-plating-of-aluminium polyester film, dried the sensitization stratification liquid which furthermore mixed and was obtained for 30 minutes at 100 degrees C, the sensitization layer with a thickness of about 16 micrometers was made to form, and photo conductor No.36 of this invention were created.

[0041] On the polyester film substrate which carried out the example 37 vacuum plating of aluminium, blade coating of the charge conveyance layer coating liquid used in the example 1 was carried out like the example 1, subsequently it dried, and the charge conveyance layer with a thickness of about 20 micrometers was formed. The bis-azo pigment (P-2) 13.5 section, the polyvinyl-butylal (trade name: XYHL union carbide plastics company make) 5.4 section, THF After carrying out grinding mixing of the 680 sections and the ethylcellosolve 1020 section in a ball mill, the ethylcellosolve

1700 section was added, stirring mixing was carried out, and the coating liquid for charge generating layers was obtained. Spray coating of this coating liquid was carried out on the above-mentioned charge conveyance layer, it dried for 10 minutes at 100 degrees C, and the charge generating layer with a thickness of about 0.2 micrometers was formed. Furthermore, carried out spray coating of the methanol / the n-butanol solution of polyamide resin (trade name: CM-8000, Toray Industries make) on this charge generating layer, dried for 30 minutes at 120 degrees C, the protective layer with a thickness of about 0.5 micrometers was made to form, and photo conductor No.37 were created.

[0042] After the line made it corona discharge (-6kV or +6kV) charged for 20 seconds about photo conductor No.1-37 built in this way using a commercial electrostatic tracing paper testing device (KK Kawaguchi electrical machinery factory SP428 mold), Leave it in a dark place for 20 seconds, and the surface potential Vpo (volt) at that time is measured. Subsequently, time amount (second) until it irradiates tungsten lamp light so that the illuminance on the front face of a photo conductor may become 4.5 luxs, and the surface potential is set to one half of Vpo(es) was found, and light exposure E1 / 2 (luxes and second) were computed. The result is shown in Table 3.

[0043] Moreover, after making it each above photo conductor charged using a commercial electrophotography copying machine, performed the optical exposure through original drawing, the electrostatic latent image was made to form, and negatives were developed using the dry-developing agent, electrostatic image transfer of the obtained image (toner image) was usually carried out in the paper, and when established, the clear transfer picture was obtained. When an aqueous developer was used as a developer, the clear transfer picture was obtained similarly.

[Table 3-(1)]

感光体No.	Vpo (ボルト)	E 1 / 2 (ルックス・秒)
1	- 1 4 4 6	1. 5 1
2	- 1 4 5 1	1. 6 7
3	- 1 4 2 2	1. 0 1
4	- 1 3 8 7	1. 1 7
5	- 1 3 2 1	0. 8 0
6	- 1 0 1 5	0. 5 2
7	- 9 5 1	1. 5 0
8	- 1 4 0 6	1. 1 7
9	- 1 4 8 8	1. 2 3
10	- 1 3 0 5	0. 9 0
11	- 1 2 9 7	0. 7 6
12	- 9 2 1	0. 4 6

[Table 3-(2)]

感光体No.	VpO (ボルト)	E1/2 (ルックス・秒)
13	-1521	1. 30
14	-1451	1. 22
15	-1389	1. 01
16	-1351	0. 96
17	-1259	0. 78
18	-1002	0. 53
19	-1361	1. 04
20	-1231	0. 96
21	-966	0. 60
22	-1421	1. 10
23	-1381	0. 97
24	-997	0. 70

[Table 3-(3)]

感光体No.	Vpo (ボルト)	E1/2 (レックス・秒)
25	-1301	0.96
26	-1278	0.79
27	-896	0.49
28	-1483	1.15
29	-1421	1.01
30	-1056	0.77
31	-1522	1.30
32	-1379	1.38
33	-1092	1.22
34	-1721	1.56
35	-1166	2.41
36	+1251	1.62

[Table 3-(4)]

感光体No.	Vpo (ボルト)	E1/2 (レックス・秒)
37	+1065	0.92

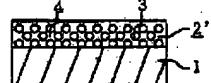
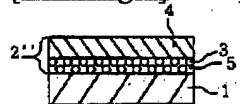
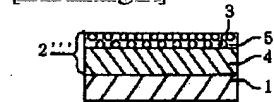
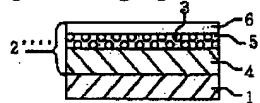
[0044] [Effectiveness] Not to mention excelling in the sensitization property, the reinforcement to the impact of heat or a machine target is size, and, moreover, the photo conductor of this invention can be manufactured cheaply.

[Translation done.]

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DRAWINGS**[Drawing 1]****[Drawing 2]****[Drawing 3]****[Drawing 4]****[Drawing 5]**

[Translation done.]

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